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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,194	05/12/2006	Moo-Seok Lee	3254-0137PUS1	6707
2292 7590 04/09/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER MENON, KRISHNAN S				
ART UNIT 1797		PAPER NUMBER		
NOTIFICATION DATE 04/09/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/579,194

**Applicant(s)**

LEE ET AL.

**Examiner**

Krishnan S. Menon

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Claims 1-11 are pending as amended 2/18/09.

#### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of copending Application No. 10/593,480. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims of the reference application recites all the limitations of the instant claims

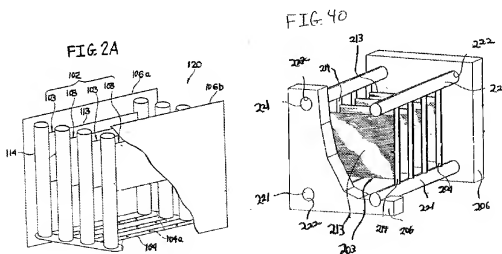
This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

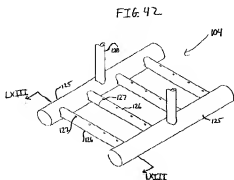
***Claim Rejections - 35 USC § 103***

1. Claims 1-6 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al (US 6,328,886) or Cote et al (US 2002/0139748), or Mahendran (US RE 39294), or any combination of them.

**Miyashita** teaches hollow fiber membranes arranged between and potted into filtrate headers as claimed – see the figures. This reference also teaches the inter-connecting air diffuser unit 104 – see the figures. The module headers are spaced apart as recited in the claim 1; the air diffusion unit has support tubes and diffusion tubes, but it is unclear from the figures of the reference if the support tubes of the air diffusion unit is physically attached to the module headers (figs 2A, 26, 27, etc). However, such attachments would be within the design skills of one of ordinary skill in the art, and is not a patentable limitation. Miyashita also does not clearly state the exact location of the aeration tubes with respect to the hollow fibers.

Figures 2A, 40 and 42 of Miyashita is reproduced below as examples for clarity:





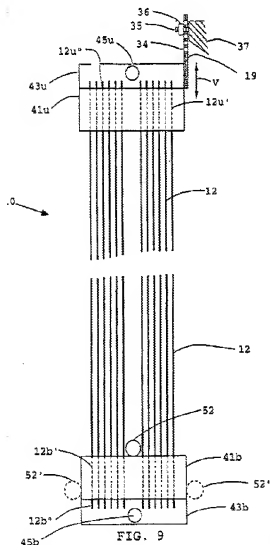
It is also unclear from the reference whether the air diffuser unit has vertical air tubes blowing air in a horizontal direction as is implied in claim 2. However, the reference does teach (column 2, lines 50-55):

*"In preferred embodiments of the invention, gas discharged from a gas diffuser of the assembly is discharged at a rate of from about 10 to about 150 Nm.sup.3 /m.sup.2 per horizontal cross-sectional area of the membrane assembly, at average vertical and horizontal flow velocities of from 0.01 m/sec to 1.5 m/sec."*

Miyashita does not teach variable air hole sizes, hole spacing etc. However, varying the air hole sizes with largest hole farthest from inlet, etc., are well known in the art for obtaining proper air distribution, as is also taught by Cote, which is described below. Sizes of holes, hole spacing, spacing of the diffusion tubes, etc., can be designed for proper and optimum air distribution, and are not patentable imitations, unless applicant can show otherwise.

**Cote** teaches a swinging air distribution system for a submerged membrane unit – see figures. The air distribution system is in the form of a frame with two horizontal and two vertical members, and has air supply inlet 42 and distribution holes 50 on the

tubular frame - see fig 3. Air holes are sized with variable sizes for proper distribution and the reference also provides some guidelines for sizing the holes - see paragraph 0047. The swing in the aerator assures that air is blown in all directions – see fig 5.



Since the length of fibers tends to change while in service, the extent of the change depending upon the particular composition of the fibers, and the spacing between the upper and lower headers is critical, it is desirable to mount the headers so that one is adjustable in the vertical direction relative to the other, as indicated by the arrow V. This is conveniently done by attaching the pan 43u to a plate 19 having vertically spaced apart through-passages 34 through which a threaded stud 35 is inserted and secured with a nut 36. Threaded stud 35 is in a fixed mounting block 37.

**Mahendran** teaches hollow fibers with permeate headers on both ends, and having aeration tubes within the hollow fiber bundle (as now claimed in claim 2) – tube 52 in figure 9 reproduced above. Mahendran also is mounted to a support system

which is adjustable for the spacing between the two headers (excerpt above from col. 22).

Mahendran also teaches that (C21/L 37-53) vertical aeration tubes that also serving as spacer is known in the art.

All the three references cited above have hollow fibers with permeate headers on both ends; and the headers are fixed in frames to be spaced apart a predetermined distance. All the three references teach a framework of aeration tubes. Mahendran teaches use of the aeration tubes as spacer for the permeate headers of the hollow fibers. All these references teach series linking of multiple modules. Thus the all the elements claimed are known in the art. See KSR Int'l. v. Teleflex Inc., 127 S. Ct. 1727, 1732, 82 USPQ2d 1385, 1390 (2007). "it is commonsense that familiar items have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle". "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results".

2. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita, Cote or Mahendran as applied to claim 1 above, and further in view of Hayano et al (US 4,061,821 or Brun et al (US 3,984,328).

Claims differ from the teaching of Miyashita or Cote in having braided hollow fibers with increased tensile strength. However, hollow fibers with braid reinforcement

is well known as seen in Hayano or Brun, and would be obvious to one of ordinary skill to use these teachings to have stronger hollow fibers. Regarding the tensile strength of the fiber of .1 Kg, or 10 Kg, the braid supported fibers of these references inherently have such capability, unless applicant can show otherwise.

### ***Response to Arguments***

Applicant's arguments filed 2/18/09 have been fully considered but they are not persuasive.

There are only two points specifically argued from the amended claims as not taught by the references cited: the aeration tube also acting as the spacer, and the aeration tube within the hollow fiber bundle. Both of these are known in the art as now shown.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the



shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797

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